TURTLE

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A hard disk backup utility by:

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IF YOU READ NOTHING ELSE, AT LEAST READ THIS!

To get started without reading any more of the documentation:

1) Copy TURTLE.PRG, TURTLE.RSC, TTLEXEC.TTP,and the proper RAMdisk into the same directory. The RAMdisks are:

TRDNSS.PRG - Single sided disks, normal format
TRDNDS.PRG - Double sided disks, normal format
TRDTSS.PRG - Single sided disks, "TWISTER" format
TRDTDS.PRG - Double sided disks, "TWISTER" format

2) Change the file type of any accessories to something other than .ACC to prevent them loading.

3) Remove all programs from your /AUTO folder except the hard disk boot program.

4) Power off your system and wait 10 seconds to insure a clean boot (especially if you have a reset-proof RAMdisk).

5) Restart your system, and open the directory with TURTLE.PRG and the other files.

6) Double click on TURTLE.PRG to start.

7) Select the necessary options. They are all described in their dialog boxes, and again under the HELP menu.

8) Select BACKUP under the FILE menu to begin writing disks.

Notes:
Only the RAMdisks supplied with TURTLE will work. Do not attempt to use any other RAMdisk.

The keyboard is scanned between files. You may cancel TURTLE at any time by pressing CONTROL-C, or press A or B to indicate a new disk is ready at any time.

INTRODUCTION

TURTLE is an extremely fast hard disk backup utility program. It requires no special hardware, and the floppies written are standard TOS disks. To accomplish this speed, certain simple steps must be taken. TURTLE requires just about all the RAM you have (for double sided disks). You should disable any accessories, and remove any unnecessary programs from your AUTO folder, before running TURTLE. You may re-establish your accessories and AUTO folder programs once the backup is complete, but TURTLE will need the RAM during the backup. The speed of this program will make the minor inconvenience of a little file manipulating well worth it.

How can it be so fast, and still write standard floppies? TURTLE creates a RAMdisk that has exactly the same characteristics as a standard diskette. It copies files from the hard disk into the RAMdisk, writing as many files as can be fit into each disk. When the RAMdisk is full, it dumps it as a track-by-track image to a floppy. It writes as many copies as you have requested, with or without formatting the floppies. The result is identical to a floppy that was written directly, except that no time was wasted moving back and forth to the directory and allocation tables, or waiting for the proper sectors to be available during disk rotation. The time difference is staggering. The only catch is that you must insure that all the RAM is available before you begin. That is very easy, and very well worth it.

Why call it "TURTLE"? Well, backing up hard disks is always a slow task, so the name fits. Since there are already several programs available with the name "BACKUP", I had intended to call this one "HARDBACK". Since turtles have hard backs anyway.....

DESKTOP

TURTLE runs from the standard GEM desktop. It may be executed by double-clicking on the TURTLE.PRG file. The resource file TURTLE.RSC must be in the same directory as TURTLE.PRG, as must be the backup utility TTLEXEC.TTP and the proper RAMdisk:

TRDNSS.PRG - Single sided disks, normal format
TRDNDS.PRG - Double sided disks, normal format
TRDTSS.PRG - Single sided disks, "TWISTER" format
TRDTDS.PRG - Double sided disks, "TWISTER" format

TURTLE requires a large amount of memory to use the RAMdisk and execute at the same time. You should disable any accessories and remove any non-critical programs from your AUTO folder before attempting to execute it. You must have a 1 megabyte machine, or larger, to run TURTLE.

It includes an ABOUT menu item under the DESK menu to identify itself. Clicking on it will display a normal dialog box, identifying the date and version of the program.

Under the FILE menu is the usual QUIT item, to terminate the program without executing a backup. There is also a BACKUP menu item, to initiate a backup, and a SYSTEM RESET item. The SYSTEM RESET item is there to make it easier to free the RAM necessary to execute a backup, and insure that the folders accessed before TURTLE is executed do not interfere with the backup. It is a good idea to do a reset just before beginning TURTLE to clear the folder limits (see the warning below). Since a manually triggered system reset, by pressing the reset button, will not clear the bits in the drive allocation map, this system reset function will clear the bit associated with drive M: before executing the reset. If you are using a reset-proof RAMdisk, however, there is no choice but to power off your system and re-boot

(without the RAMdisk) to free the memory.

OPTIONS

TURTLE runs from the desktop, using standard GEM drop-down menus for entering options. There is a HELP menu item for each OPTION item, to provide information at any time.

Archive:

This option inhibits a normal function, setting the archive bit. When a file is copied, TURTLE will set the bit unless the ARCHIVE option has been used to disable the feature. This bit can be used to instruct subsequent backups to copy only the files which have changed since the last time TURTLE (or some other backup utility which set the archive bit) was executed. The default for this switch is to set the archive bit. When the checkmark is displayed beside the Archive option, the archive bit will be set on all files copied.

??? Copies:

This option is used to generate extra copies of any disk written during backup. Normally, only one copy of each disk is written. To request additional copies, enter the number of copies desired. The default for this option is to write one backup copy. The menu item changes to reflect the number of copies selected.

Format:

This is the diskette format option. TURTLE assumes that the disks to be written to are already formatted, unless this option is used to override that assumption. When disks in the "TWISTER" format are used, they must already be formatted. TURTLE will not format "TWISTER" disks. It is not necessary that the disks be erased, since anything on them will be over-written. It is never harmful to use the format option, but it will cause the program to run a bit slower. The default for this option is to write to floppies without formatting. When the checkmark is displayed beside this option the diskettes will be formatted before they are written.

Full Backup:

This option is used to indicate whether the backup should be full (all files in all the named directories) or incremental (only the files in the named directories which have been altered since the last backup). This can shorten the time required to back up a drive when few files have been changed. It does require, however, that the user keep the original backup, plus the intervening incremental backups, to be able to re-construct the contents of the drive. The default for this option is to backup all the files in the paths entered. The menu item will change to Incremental when that mode is selected.

Double Sided:

This option is used to indicate that the backup will be done to double-sided disks, rather than single sided disks. It is imperative that the proper option be selected, matching the diskettes to be used. If the backup is executed with the wrong diskette option, the backup will not be useable and may create errors during floppy writing. The default for this option is to write double sided disks. When single sided disks are selected, the menu item will change to reflect that option.

Disk Numbers:

This option is used to define the number assigned to the first diskette written. Normally, diskettes are numbered beginning with one. However, if a backup is being executed by paths (to avoid the 40 folder limit), subsequent paths may be better organized if the numbers assigned to the disks are sequential. This option will offer a dialog box which can be used to set the number assigned to the first disk written. The default is to start numbering disks with 1. When the checkmark is displayed beside this option, some number other than 1 has been selected to begin assigning to disks.

Path:

This option is used to specify the disk path to read. All files (or all non-archived files if INCREMENTAL is set) in the named path will be read and copied to the diskettes. Only the files in the named path will be read or marked with the ARCHIVE bit (if ARCHIVE is enabled). The default for this option is the path from which TURTLE was initiated. When the checkmark is displayed by this option, the path has been changed from the default.

Files Only:

This option is used to limit the path following option of TURTLE. Normally, TURTLE will begin at the path named, and follow all folders in that path, copying all files in all folders (unless INCREMENTAL is set). Then, after all folders in the path have been copied, all the files in the named path are copied. Using the FILES ONLY option will prevent TURTLE from opening any of the folders in the path. Only the files in the named path will be copied. The default for this option is to open the folders, and back up all the files in the folders as well as those in the path. When the checkmark is displayed by this option, only the files in the path named, but not those in the folders, will be backed up.

Verify:

TURTLE writes diskettes as direct images of disk tracks built in memory on the RAMdisk. When the RAMdisk is full, it is copied, track-by-track, to a floppy disk. The track copy function does not read data back to see if the disk write was successful. If you wish to re-read the data after it is written to the floppy, select the Verify option. This option defaults to write the floppy without re-reading it. When the checkmark is displayed, the data will be read back after writing.

EXECUTION

Before TURTLE can be executed, your system must not be in low res mode, and there must be an adequate amount of memory available. You must disable any accessories or unnecessary "AUTO" programs to insure that there is space available for TURTLE to execute. This includes autoboot programs and folder fix programs such as GEMBOOT and FOLDRXXX. They consume memory that is required for the RAMdisk. TURTLE contains code to help avoid folder crashes.

===>>> WARNING!!! <<<===

There is a problem in GEMDOS dealing with folders (sometimes referred to as sub-directories). GEMDOS becomes unstable when too many folders are accessed. Currently, 40 folders is assumed to be a safe limit for folders on a system. TURTLE uses some techniques to make the folder problem less severe. When you specify the path you wish to backup, there may be folders in that path. Folders which reside directly in the path name may themselves contain other folders. TURTLE will "clear" the folder count each time it completes backing up

a folder which resides directly in the named path. TURTLE can not clear the folder count during the backing up of any other folder, only when it finishes a folder at the "top" of the named path. For example, if drive "C:" contains 80 folders, and many of those contain more folders, like this:

C:\FOLDER00 (contains 15 more folders)
C:\FOLDER01 (contains 12 more folders)
C:\FOLDER02 (contains 24 more folders)
C:\FOLDER03 (contains no more folders)

C:\FOLDER78 (contains 31 more folders)
C:\FOLDER79 (contains 13 more folders)

and you instructed TURTLE to back up drive "C:", you would encounter no problems. As TURTLE backed up C:\FOLDER00, the folder count would climb to 19 (15 folders, C:\, C:\FOLDER00, M:, and M:\FOLDER00). On the RAMdisk, only the folders in the path being are counted. All other folders on the RAMdisk are removed from the count as soon as they are completed. When the last file of FOLDER00 was copied, before FOLDER01 was started, the folder count would drop to 3 (C:, C:\FOLDER01, and M:), then rise to 4 as soon as M:\FOLDER01 was created. Drive C: itself could contain any number of folders, as far as TURTLE was concerned. You would probably have problems with other programs, however, so this is still not considered wise. If any single folder at the top level of drive C: contained more than 40 folders, though, you could experience problems with TURTLE. If this is the case, you must back up drive C: by selecting groups of folders, then re-running with the single folders which contain more than 40 folders. If FOLDER31 contained 90 folders (counting all folders contained within those folders), you would have to back up all folders except 31, then back up FOLDER31 by itself. The PATH dialog box has been widened to make this easier. The simplest way to explain this is to think that the 40 folder limit has been moved one level of folders lower in the path that you enter. It may be easier to grasp the idea if you watch the folder count climb as the backup is running, then suddenly drop as a folder is completed.

Once TURTLE begins, it will start copying files, even though there are no disks ready. Do not be concerned. TURTLE will be establishing the RAMdisk images, and no floppies are required until the RAMdisk is full. Once the RAMdisk is full, it will be dumped to the floppies, and will post messages to identify which disk is which in sequence. If you do not stay ahead of TURTLE in keeping disks ready, it will start ringing the console bell until you return, and provide more diskettes.

TURTLE will keep all the files in a folder together, in an identically named folder, on the floppy image. Of course, a single hard disk folder may be split across several floppies. If no files are to be copied from a folder, no empty folders will be created. The sequence of the files in the folder will be the largest file that fits first. This allows TURTLE to use the floppies as efficiently as possible. TURTLE will not attempt to copy a file that is too large to fit on a blank floppy, but will log a message on the screen (remember that each folder requires 1K, so there is less space available when folders are nested).

THE DISPLAY

maintains an informative display during the backup process. It requires lines of 80 characters, so you must not be in low res mode. At the top is the sign on banner, and the current version number. Next is the status line for the floppy drives. Each drive will always have a status indicated:

DISK NEEDED

Used only at startup. Be sure an appropriate disk is inserted, and press the key corresponding to the floppy drive (A or B, upper or lower case). When a disk has been inserted, and the proper key pressed, the status will change to READY. You may change disks any time that the disk access for the floppy drive is not on, and press the keys at any time. TURTLE is designed to allow you to set up two disks and walk off. It will use them both, then start ringing bells to let you know when it needs a new pair. It will let you know what order the disks were written in. If you stay ahead of TURTLE in keeping disks ready, it will alternate between drive A and B. If both disks are full, it will use whichever one you key in as ready first. If you do not have a second drive, do not press the "B" key, and TURTLE will work with drive "A" exclusively. If you re-use the same disks for backup, with labels on them, it is very easy to keep them in sequence.

FULL Disk ## Copy #

Informs you that the floppy in the designated drive is full, and must be changed. The ## is the number of the disk in sequence, and the # will show which copy it is, when multiple copies are requested. You may change a disk at any time, and press the keys at any time, so long as you do not attempt to remove a disk while the drive's access light is on.

READY

You have indicated that a blank disk is in the drive, ready for writing. When the RAMdisk is full, this drive will be written to. If both drives are READY, TURTLE will write to whichever one was not used last.

DISK ERROR

Well, these things happen. TURTLE is very good at recovering, however. Since the entire image of the floppy is in the RAMdisk, just insert a new floppy in the drive, press RETURN, and TURTLE will start writing that copy over. Just discard, re-cycle, or furiously mangle the disk with the error. It is unimportant. Your backup will be perfectly valid, no matter how many diskette errors occur. Ignore any disks with errors, and keep the ones TURTLE identified as FULL. When an error occurs, you must replace the disk in the drive with the error, and press RETURN. TURTLE will not go off writing on other (possibly labelled) disks and leave bad ones lying around. This helps keeps things orderly.

TERMINATION PENDING

You have pressed the terminate key "T". TURTLE will finish writing the current disk (however many copies were requested), then stop executing. If the Archive bit was being set, only the files copied will be marked as archived. All files copied will have been properly marked, so the backup may be restarted at a later time, and the remaining files will be copied.

Read error. Options: A=Abort Backup. S=Skip this file:

A read error has occurred on the hard disk. TURTLE is unable to backup the current file. You may abort the backup by pressing A (or a). The abort is immediate. Files in the RAMdisk are not copied to floppies. You may skip the file with the read error by pressing S (or s), and the backup will continue with the next file.

Other lines on the display are clearly labelled: the input request being processed, the current path being copied, the number of files in the path, how many remain to be copied, and byte sizes. There is a folder count displayed. Remember that it is only the number of

folders read or written by TURTLE, and only during the current execution. There is a log of files that have been copied, and their sizes. It starts at the middle of the screen, and scrolls down. The file being copied is the one at the top of the list, and it will scroll down and off the page as subsequent files are copied.

KEYBOARD

While the backup is running, TURTLE keeps checking the keyboard. You can type in commands at any time. TURTLE will see them within one or two seconds, as soon as the current disk I/O operation is completed. All commands are a single letter, and do not require that the RETURN key be pressed. The following commands are active at any time, except when a disk I/O has occurred:

A (or a) - a floppy disk has been inserted in drive A, and is ready for use.

B (or b) - a floppy disk has been inserted in drive B, and is ready for use.

T (or t) - terminate the program after the current floppy disk. All copies requested will be written before termination occurrs. If the ARCHIVE option was requested, only the files backed up are marked as archived.

Control-C - Cancel the program immediately. Files copied into the RAMdisk are not copied to a floppy.

CREDIT WHERE CREDIT IS DUE DEPARTMENT

TURTLE could not function without the use of its RAMdisk. This one has special functions and characteristics I have added to support TURTLE. TURTLE absolutely will not work with any other RAMdisk, so don't bother trying. This particular RAMdisk is a highly modified version of one originally written by Landon Dyer of Atari, and placed in the public domain. My thanks to Landon Dyer for the use of his work.

SUMMARY

TURTLE works quite well, and with (I think) amazing speed. It is even smart enough to not copy unused tracks at the end of a diskette, but it will format them if formatting has been requested (who needs a partially formatted disk?). The most important thing is to be sure you free enough RAM to build the RAMdisk and run the program before beginning. TURTLE is fairly bullet proof, and is very informative while running. You can kill it at most any time by pressing Control-C, and it will stop almost immediately. You can request that it stop at the end of all copies of the current disk by pressing "T". You do not have to wait for it to need disks to make them ready, you may press the appropriate keys whenever you have inserted the disks.

TURTLE is really only a GEM desktop front end for the program which does the backup work, called TTLEXEC.TTP. TURTLE writes one command line, then uses it to invoke TTLEXEC.TTP to do the real work. You can use TTLEXEC.TTP from the command line without using TURTLE if you like. See TTLEXEC.MAN for documentation.

TURTLE is over a quarter million bytes of source code, which is not included in the .ARC file. The programs are copyrighted, but released for public distribution. TURTLE is not to be sold except for nominal charges for media, reproduction, and/or connect charges while downloading.

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If TURTLE gives you any trouble, or you have any suggestions, please feel free to contact:

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NAME

ttlexec - execute hard disk backup

SYNOPSIS

ttlexec [-acdfinost] path [...path]

DESCRIPTION

ttlexec does disk backup to floppies by reading the specified path name(s) and writing either all files, or all unarchived files. It uses a RAMDISK to create an in-memory image of the floppy to write, then does a track-by-track copy of the RAMdisk image. The only RAMdisks useable are TRDNSS.PRG for normal format single sided diskettes, TRDNDS.PRG for double sided normal format diskettes, TRDTSS.PRG for "TWISTER" format single sided diskettes, and TRDTDS.PRG for "TWISTER" format double sided diskettes. Before executing ttlexec, nearly all of the system memory must be available.

-a inhibit setting the ARCHIVE bit on files as they are copied. Normally the ARCHIVE bit is set as the files are backed up.

-c # write # copies of each disk. Normally, only one copy of each diskette is written.

-d hold screen after completion. Normally used only when invoked from the desktop.

-f format floppies before writing. Normally floppies are assumed to be formatted and ready for writing. They need not be erased since ttlexec will over-write any existing data on the disks. Only normal format diskettes can be formatted, "TWISTER" disks must be pre-formatted.

-i incremental backup. Copy only the files with the ARCHIVE bit reset. Normally, all files are copied.

-n # number the output disks starting with #. Normally output disks are numbered beginning with 1.

-o only files are to be copied. All files in the named path are backed up (unless -i is specified), but folders within the named path are not backed up.

-s single sided output disks. Normally output is prepared for double sided disks.

-t write diskettes in "TWISTER" format.

-v verify output disks. Normally output disks are written, but not read back.

BUGS

GEMDOS has a significant problem when over 40 folders are accessed between system resets. Avoid this by backing up specific path names to control the number of folders read and written between resets. An error will occur if more than 112 files are written to the root directory of the RAMdisk between floppy writes.

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